

CLAIMS

1. A recording and/or reproducing device comprising:

an optical pickup having an objective lens and provided to be movable in the radial direction of an optical disc;

a first rack portion provided on the optical pickup;

a slide member having an opening/closing portion for opening/closing a facing surface of the objective lens to the optical disc, and a second rack portion provided to be slidable on the first rack portion; and

a driving mechanism having a driving gear which meshes with the first rack portion and the second rack portion;

wherein when the first and second rack portions are driven by the driving gear and the optical pickup is thus moved to a predetermined position, the meshing state of the first rack portion with the driving gear is canceled and the second rack portion is driven by the driving gear to move the slide member, thereby moving the opening/closing portion from a position for opening the facing surface side of the objective lens to a position for closing the facing surface side.

2. The recording and/or reproducing device as claimed in claim 1, wherein when the optical pickup has reached a predetermined position on the inner circle side of the optical disc, the meshing state of the driving gear with the first rack portion is canceled.

3. The recording and/or reproducing device as claimed in claim 2, further comprising a detecting section for detecting that the optical pickup has reached a predetermined position on the inner circle side of the optical disc.

4. The recording and/or reproducing device as claimed in claim 3, wherein the detecting section is operated by the optical pickup when the optical pickup has reached at least a position in a table-of-contents area of the optical disc.

5. The recording and/or reproducing device as claimed in claim 3, further comprising a control section for driving a driving motor for a predetermined time period on the basis of a detection output from the detecting section.

6. The recording and/or reproducing device as claimed in claim 5, wherein as the driving motor is driven for a predetermined time period, the optical pickup is moved further toward the inner circle side of the optical disc.

7. The recording and/or reproducing device as claimed in claim 5, further comprising a regulating portion to which the optical pickup is abutted and which is adapted for regulating the movement of the optical disc, wherein as the optical pickup is abutted against the regulating portion and has its movement regulated by the regulating portion, the meshing state of the first rack portion with the driving gear is canceled.

8. The recording and/or reproducing device as claimed in claim 1, wherein at least one protrusion is provided on the slide member and an abutment portion to be abutted against the protrusion is provided on the optical pickup, and wherein as the second

rack portion is moved by the driving motor in a direction such that the opening/closing

portion opens the facing surface side, thus abutting the protrusion against the abutment

portion, the first rack portion is meshed with the driving gear.

9. The recording and/or reproducing device as claimed in claim 8, further

comprising an elastic member tensioned between the first rack portion and the second.

rack portion..

10. The recording and/or reproducing device as claimed in claim 9, wherein as the

first rack portion is meshed with the driving gear, the slide member is slid and the

protrusion and the abutment portion are moved away from each other.

11. The recording and/or reproducing device as claimed in claim 1, wherein the

optical pickup further has a cover which has an aperture formed therein at a position

facing the objective lens and which is adapted for at least covering the objective lens,

and wherein the opening/closing portion moves on the cover between the position for

opening the facing surface and the position for closing the facing surface, thereby

opening/closing the aperture.

12. ... The recording and/or reproducing device as claimed in claim 1, further.

comprising a regulating portion to which the optical pickup moved toward the inner

circle of the optical disc is abutted and which is adapted for regulating the movement

of the optical pickup, wherein as the optical pickup is abutted against the regulating

portion and has its movement regulated by the regulating portion, the meshing state.

of the first rack portion with the driving gear is canceled.

13. The recording and/or reproducing device as claimed in claim 12, wherein the driving motor is driven in a direction for moving the optical pickup further toward the inner circle, the second rack portion is driven and the slide member is moved, thus moving the opening/closing portion from the position for opening the facing surface side of the objective lens to the position for closing the facing surface side.

14. The recording and/or reproducing device as claimed in claim 13, wherein when the optical pickup has been moved to at least a position in a table-of-contents area of the optical disc, the driving motor is driven for a predetermined time period in the direction for moving the optical pickup further toward the inner circle.

15. The recording and/or reproducing device as claimed in claim 14, further comprising a detecting section for detecting that the optical pickup has been moved to at least a position in the table-of-contents area of the optical disc, and a control section for driving the driving motor for a predetermined time period in the direction for moving the optical pickup further toward the inner circle, on the basis of the detection result from the detecting section.

16. The recording and/or reproducing device as claimed in claim 15, wherein the control section has a timer circuit for timing the predetermined time period.

17. The recording and/or reproducing device as claimed in claim 12, wherein at least one protrusion is provided on the slide member and an abutment portion to be abutted against the protrusion is provided on the optical pickup; and wherein as the second rack portion is moved by the driving motor in a direction such that the

opening/closing portion opens the facing surface side, thus abutting the protrusion against the abutment portion; the first rack portion is meshed with the driving gear.

18. The recording and/or reproducing device as claimed in claim 17, further comprising an elastic member tensioned between the first rack portion and the second rack portion.

19. The recording and/or reproducing device as claimed in claim 18, wherein as the first rack portion is meshed with the driving gear, the slide member is slid and the protrusion and the abutment portion are moved away from each other.

20. An optical pickup device comprising:

an optical pickup section having an objective lens and provided to be movable along a guide portion;

a first rack portion provided on the optical pickup section;

a slide member having an opening/closing portion for opening/closing a facing surface of the objective lens to an optical disc, and a second rack portion provided to be slidable on the first rack portion; and

a driving mechanism having a driving gear which meshes with the first rack portion and the second rack portion;

wherein when the first and second rack portions are driven by the driving gear and the optical pickup section is thus moved to a predetermined position, the meshing state of the first rack portion with the driving gear is canceled and the second rack portion is driven by the driving gear to move the slide member, thereby moving the

opening/closing portion from a position for opening the facing surface side of the objective lens to a position for closing the facing surface side.

21. The optical pickup device as claimed in claim 20, wherein at least one protrusion is provided on the slide member and an abutment portion to be abutted against the protrusion is provided on the optical pickup section, and wherein as the second rack portion is moved by the driving motor in a direction such that the opening/closing portion opens the facing surface side, thus abutting the protrusion against the abutment portion, the first rack portion is meshed with the driving gear.

22. The optical pickup device as claimed in claim 21, further comprising an elastic member tensioned between the first rack portion and the second rack portion.

23. The optical pickup device as claimed in claim 22, wherein as the first rack portion is meshed with the driving gear, the slide member is slid and the protrusion and the abutment portion are moved away from each other.

24. The optical pickup device as claimed in claim 20, wherein the optical pickup section further has a cover which has an aperture formed therein at a position facing the objective lens and which is adapted for at least covering the objective lens, and wherein the opening/closing portion moves on the cover between the position for opening the facing surface and the position for closing the facing surface, thus opening/closing the aperture.

25. The optical pickup device as claimed in claim 20, further comprising a guide portion for guiding the movement of the optical pickup section in the radial direction

of the optical disc, wherein the guide portion has a supporting shaft for guiding the optical pickup section, a reference portion abutted at least at two positions of an outer circumferential portion of the supporting shaft for positioning the supporting shaft, an engagement portion engaged with the outer circumferential portion of the supporting shaft, and an elastic displacement portion formed integrally with the engagement portion for energizing the engagement portion in the radial direction of the supporting shaft.

26. The optical pickup device as claimed in claim 25, wherein the elastic displacement portion is bent from a direction substantially parallel to the axial direction of the supporting shaft to a direction substantially orthogonal to the axial direction of the supporting shaft, thereby energizing the engagement portion in the radial direction of the supporting shaft.

27. A recording and/or reproducing device comprising:

an optical pickup having an objective lens and provided to be movable in the radial direction of an optical disc;

a first rack portion provided on the optical pickup;

a slide member having an opening/closing portion for opening/closing a facing surface of the objective lens to the optical disc, and a second rack portion provided to be slidable on the first rack portion; and

a driving mechanism having a driving gear which meshes with the first rack portion and the second rack portion;

wherein when the first and second rack portions are driven by the driving gear and the optical pickup is thus moved to a predetermined position, the meshing state of the first rack portion with the driving gear is canceled and the second rack portion is driven by the driving gear to move the slide member, thereby moving the opening/closing portion from a position for opening the facing surface side of the objective lens to a position for closing the facing surface side, and causing the opening/closing portion to close the facing surface side in a standby state.

28. The recording and/or reproducing device as claimed in claim 27, further comprising a regulating portion to which the optical pickup moved toward the inner circle of the optical disc is abutted and which is adapted for regulating the movement of the optical pickup, wherein as the optical pickup is abutted against the regulating portion and has its movement regulated by the regulating portion, the meshing state of the first rack portion with the driving gear is canceled.

29. The recording and/or reproducing device as claimed in claim 28, wherein the driving motor is driven in a direction for moving the optical pickup further toward the inner circle, the second rack portion is driven and the slide member is moved, thus moving the opening/closing portion from the position for opening the facing surface side of the objective lens to the position for closing the facing surface side.

30. The recording and/or reproducing device as claimed in claim 29, wherein when the optical pickup has been moved to at least a position in a table-of-contents area of the optical disc, the driving motor is driven for a predetermined time period in the

direction for moving the optical pickup further toward the inner circle.

31. The recording and/or reproducing device as claimed in claim 30, further comprising a detecting section for detecting that the optical pickup has been moved to at least a position in the table-of-contents area of the optical disc, and a control section for driving the driving motor for a predetermined time period in the direction for moving the optical pickup further toward the inner circle, on the basis of the detection result from the detecting section.

32. The recording and/or reproducing device as claimed in claim 31, wherein the control section has a timer circuit for timing the predetermined time period.

33. The recording and/or reproducing device as claimed in claim 28, wherein at least one protrusion is provided on the slide member and an abutment portion to be abutted against the protrusion is provided on the optical pickup, and wherein as the second rack portion is moved by the driving motor in a direction such that the opening/closing portion opens the facing surface side, thus abutting the protrusion against the abutment portion, the first rack portion is meshed with the driving gear.

34. The recording and/or reproducing device as claimed in claim 33, further comprising an elastic member tensioned between the first rack portion and the second rack portion.

35. The recording and/or reproducing device as claimed in claim 34, wherein as the first rack portion is meshed with the driving gear, the slide member is slid and the protrusion and the abutment portion are moved away from each other.